Dr. James Cruickshank, NUI Galway

Title: Symmetric configurations of line segments

Abstract:

The intersection graph of a set of subsets of the plane is an object of much interest in combinatorial geometry. For example, the circle packing theorem theorem says that any finite plane simple graph can be realised as the intersection graph of some collection of interior disjoint discs in the plane. In this talk we consider collections of line segments that are pairwise interior disjoint. In the early 1990s Thomassen has shown that plane Laman graphs (definitions will be given) are precisely those that can be realised as the intersection graph of such collections of line segments. There have been several extensions and variations of this result since. I will present an introduction to some of this theory and then discuss some recent joint work with Bernd Schulze (Lancaster University) on symmetric versions of Thomassen's result. This involves some interesting connections with topological graph theory and with some matroids that arise naturally in other areas of combinatorial geometry.